

LightViper
FIBER OPTIC AUDIO SNAKE

USER MANUAL FOR
VIM-1832 / 1032

Warning for Your Protection

1. Read these instructions
2. Keep these instructions
3. Heed all warnings
4. Follow all instructions
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen onto the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



the apparatus.
tip-over.

been damaged
fallen into the

The apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus.

"WARNING To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture."

General Installation Instructions

Please consider besides these general instructions also any product-specific instructions in the "Installation" chapter of this manual.

Unpacking

Check the equipment for any transport damage. If the unit is mechanically damaged, if liquids have been spilled or if objects have fallen into the unit, it must not be connected to the AC power outlet, or it must be immediately disconnected by unplugging the power cable. Repair must only be performed by trained personnel in accordance with the applicable regulations.

Installation Site

Install the unit in a place where the following conditions are met:

- The temperature and the relative humidity of the environment must be within the specified limits during operation of the unit. Relevant values are the ones at the air inlets of the unit.
- Condensation must be avoided. If the unit is installed in a location with large variation of ambient temperature (e.g. in an OB-van), appropriate precautions must be taken before and after operation.
- Unobstructed air flow is essential for proper operation. Air vents of the unit are a functional part of the design and must not be blocked in any way during operation (e.g. by objects placed upon them, placement of the unit on a soft surface, or installation of the unit within a rack or piece of furniture).
- The unit must not be heated up by external sources of heat radiation (sunlight, spot lights).

Ambient Temperature

Units and systems by LightViper are generally designed for an ambient temperature range (i.e. temperature of the incoming air) of +5...+40 °C. When rack mounting the units, the following facts must be considered:

- The admissible ambient temperature range for operation of the semiconductor components is 0 °C to +70 °C (commercial temperature range for operation).
- The air flow through the installation must provide that the outgoing air is always cooler than 70 °C.
- Average heat increase of the cooling air shall be about 20 K, allowing for an additional maximum 10 K increase at the hot components.
- In order to dissipate 1 kW with this admissible average heat increase, an air flow of 2.65 m³/min is required.
*Example: A rack dissipating P = 800 W requires an air flow of 0.8 * 2.65 m³/min which corresponds to 2.12 m³/min.*
- If the cooling function of the installation must be monitored (e.g. for fan failure or illumination with spot lamps), the outgoing air temperature must be measured directly above the modules at several places within

Earthing and Power Supply

Earthing of units with mains supply (class I equipment) is performed via the protective earth (PE) conductor integrated in the mains cable. Units with battery operation (< 60 V, class III equipment) must be earthed separately. Earthing the unit is one of the measures for protection against electrical shock hazard (dangerous body currents). Hazardous voltage may not only be caused by defective power supply insulation, but may also be introduced by the connected audio or control cables.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel

If your unit mains supply is provided via a Neutrik PowerCon™ connector the following precautions must be followed:

- The PowerCon must be installed and fully engaged before AC power is applied to the unit.
- The unit must be disconnected from the mains supply before disengaging the PowerCon connector.

Class I Equipment (Mains Operation)

Should the equipment be delivered without a matching mains cable, the latter has to be prepared by a trained person using the attached female plug (IEC320/C13 or IEC320/C19) with respect to the applicable regulations in your country.

Before connecting the equipment to the AC power outlet, check that the local line voltage matches the equipment rating (voltage, frequency) within the admissible tolerance. The equipment fuses must be rated in accordance with the specifications on the equipment.

Equipment supplied with a 3-pole appliance inlet (protection conforming to class I equipment) must be connected to a 3-pole AC power outlet so that the equipment cabinet is connected to the protective earth.

WARNING

If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

Registration

Be sure to register your LightViper product, either by filling in the enclosed Registration Card or by completing the on-line registration form at our Web site:

<http://lightviper.com/register>

If you do so, FiberPlex can contact you with any update information. As enhancements and upgrades are developed, you will be contacted at the registration address. Please read this manual - if you call for technical support, we'll assume that you have.

Please address any inquiries to your dealer or directly to FiberPlex at:

FiberPlex Technologies, LLC
10840-412 Guilford Rd.
Annapolis Junction, MD 20701
301.604.0100 Fax: 301.604.0773
sales@fiberplex.com

Warranty, Service and Terms and Conditions of Sale

For information about Warranty or Service information, please see our published 'Terms and Conditions of Sale'. This document is available on fiberplex.com or can be obtained by requesting it from sales@fiberplex.com or calling 301.604.0100.

Disposal

Disposal of Packing Materials

The packing materials have been selected with environmental and disposal issues in mind. All packing material can be recycled. Recycling packing saves raw materials and reduces the volume of waste. If you need to dispose of the transport packing materials, please try to use recyclable means.

Disposal of Used Equipment

Used equipment contains valuable raw materials as well as materials that must be disposed of professionally. Please return your used equipment via an authorized specialist dealer or via the public waste disposal system, ensuring any material that can be recycled is. Please take care that your used equipment cannot be abused. After having disconnected your used equipment from the mains supply, make sure that the mains connector and the mains cable are made useless.

Declarations of Conformity

Class A Equipment - FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.



Disclaimer

The information in this document has been carefully checked and is believed to be accurate at the time of publication. However, no responsibility is taken by us for inaccuracies, errors, or omissions, nor is any liability assumed for any loss or damage resulting either directly or indirectly from use of the information contained within it.

Introduction

Congratulations on your purchase of a Light Viper 1832 fiber optic audio snake—a lightweight, flexible breakthrough for professional sound production.

Light Viper products are designed, engineered and manufactured by FiberPlex, experts in fiber optics with decades of experience. Our work in audio and data communications products is known in US government applications worldwide. Light Viper products, combine our pioneering technology with the highest standards in audio engineering.

The Light Viper

You have purchased the LightViper 1832 system, a 32 x 8 Fiber Optic Transport System (FTS) that has the function, look and feel of a traditional copper snake; however instead of a heavy multi-conductor cable the Light Viper snake features a lightweight, flexible fiber built to “ruggedized” military standards.

The Fiber Advantage

Fiber optics offer many advantages over copper:

- Transmits light rather than electrons
- Transmission over greater distances (more than 11/4 mile)
- Complete electrical isolation
- Immunity to RFI and EMI
- Eliminates ground loop problems
- Can be routed overhead, through walls, or underground
- Avoids foot traffic while maintaining aesthetics

Functional Considerations

Although the Light Viper 1832 looks essentially the same as a traditional, passive snake, it is an active device. Because of this, there are some aspects of this new technology that require some slightly different thinking:

- The Light Viper 1832 requires AC Power at both the Stage Box and the Mixer Unit(s)
- Phantom Power is delivered from the Stage Box, NOT the console
- The snake has three selectable gain settings and a clip indicator at each input on the Stage Box
- All inputs exit the snake (at the Mixer Box) at Line Level
- DI boxes are not necessary in most cases
- Input and Output flexibility may eliminate the need for some of your outboard gear
- The LightViper VIM-1832 is an active device, therefore do not attempt to connect intercom into the returns
- The returns in the VIS-1832 cannot be “turned around” to provide 40 sends one way as with a traditional copper snake, as the electronics for the returns are contained in the VIM-1832.

Standard Components

In its standard configuration, the Light Viper 1832 is made up of the following primary components.

The Stage Box

This is the box placed close to all the inputs. It can be placed on the stage or rack mounted with the optional VER-1832 rack ears.

The Mixer Box

The unit should be mounted in a rack close to the primary (FOH) mixing console

Fiber Cable

For live production, TFC-0000-04 tactical military grade fiber with TAC-4 Connectors is required between the VIM-1808 and VIM-0808. Neutrik OpticalCon® tactical fiber (TFC-0000-02-OC) is also available for similar applications. For installations where the fiber will be pulled through conduit, either VFC-0000-D (PVC fiber) or VFC-0000-DP (Plenum rated fiber) with ST connector terminations is recommended. There is also an option for a "Pulling Eye" which can be specified by adding an "E" to the part numbers above (VFC-0000-DE; VFC-0000-DPE). This option includes a strain relief and pulling eye on one end of the fiber optic cable.

Lightweight military "tactical grade" fiber 'cable' (TFC-0000-04) carries the digital signal between LightViper devices. Neutrik OpticalCon® tactical cable is also available. For installation use, either PVC or Plenum rated fiber is recommended (VFC-0000-D, VFC-0000-DP).

TAC-4 and OpticalCon® Panels

(VPL-11, VPL-12 & VPL-13).These 1U rack panels include (1), (2) or (3) TAC-4 connectors respectively allowing for connection between the TAC-4 panel mount connector and the ST connectors on the VIM-1808/0808. Neutrik OpticalCon panel mount connectors can also be mounted on these panels rather than TAC-4 connectors. Specify by using the suffix "OC" (Ex. "VPL-11-OC). TAC-4 and Neutrik OpticalCon connectors can also be fit directly on the chassis of the VIM-1808/0808 system. In applications such as these, rack ears and VPL panels are not required. All LightViper units come standard with ST connectors unless otherwise specified.

Input / Output Cables

These cables connect the Mixer Box to the analog inputs/outputs of your mixer. If you are connecting to a Yamaha digital console through the Yamaha "Y" cards, you would use VCB-DDMY and VCB-DDMYIO cables. A variety of cables to connect to other digital consoles and devices are also available.

Optional Components

Additional components can be added to the Light Viper 1832 for increased functionality.

Additional Send Box(es)

The VIM-1032 is similar to the VIM-1832 mixer box in that it provides a parallel set of the snake's 32 input channels, via an additional Fiber Cable, in applications where you need splits – for recording, broadcast, or monitor mixing. The VIS-1832 Stage Box can be fit with two "split" connectors for a total of three (1 VIM-1832 (Primary) + 2 VIM-1032 (splits) outputs.

DMX4 Lighting Control Interface

MD-3 Multi Control Interface

In applications where you want RS-422, RS-232 or Midi control in a VIM-1808/0808 system, a pair of MD-3 devices will translated this control protocol into TTL data for input to / output of the "Control Circuit" connector on the VIM-1808 / 0808.

*****Please refer to page 13 for a complete list and photos of fiber-optic cable types as well as copper interface cables.***

Getting Started

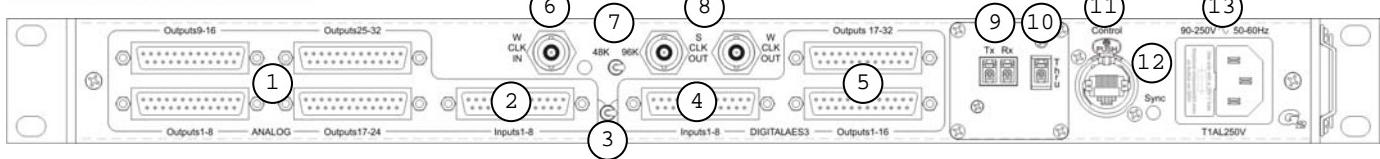
Setting up, and using your Light Viper 1832 is a quick and simple process. Just follow these steps:

1. Place the Stage Box in a location central to the majority of your signal sources. Place the Mixer Box close enough to the mixer so that the send cables can reach the console's inputs, connect AC power
2. Connect and run the Fiber between the two boxes, power up and check the Sync light on both units
3. Connect the inputs and returns to the stage box. (Be sure to select the appropriate Gain and Phantom Power settings)
4. Connect the fan out cables to the console (send & return on VIS-1832, send only on VIS-1032)
5. Turn on phantom power as necessary.
6. Starting with a gain setting of 0 dB, set the gain switch at the highest gain setting which the clip light either just flashes at the peaks or is off.
7. Start mixing.

NOTE: the signal coming into the console will be line level. When the gain switches on the VIS-1832 are properly set, the signal going into the console will be hot. Use line level inputs or engage input pads to achieve optimal signal-to-noise ratio.

The more advanced functions of the Light Viper 1832 (control, clocks, etc.) are addressed later in this manual.

Indicators and Controls



1 Analog Outputs

The (8) analog line level outputs on the VIM-1808 are connected via (1) DB25 connectors, (8) channels per DB25 connector.

2 Analog Inputs

The (8) inputs are connected via a single DB25 connector. Inputs are line level.

3 Input Selection Switch

4 Digital Inputs

The (8) digital returns are connected via a single DB25 connector. Digital inputs are all AES3 compliant.

5 Digital Outputs

The (8) AES digital outputs on the VIM-1832 are connected via (1) DB25 connectors, (8) channels per DB25 connector.

6 Primary Fiber Connection

The VIM-1808 contains a single primary pair of fiber connectors. Always be certain to use appropriate fiber and connectors. LightViper systems use multimode fiber. Single mode optics are available on a custom basis for situations where single mode fiber may already exist.

7 Fiber Thru Connection

8 Control Circuit Connector

This RJ45 connector provides (3) bi-directional CMOS or TTL data lines (up to 38.4KHz from VIM-0808 to VIM-1808 and 2MHz from VIM-1808 to VIM-0808) plus voltage and GND. This connector is used in conjunction with DGL-422 cables for transporting Yamaha control, or with MD3 units to transport RS-422, RS-232 or MIDI. THIS IS NOT AN ETHERNET CONNECTOR – CONNECTING AN ETHERNET DEVICE TO THIS CONNECTOR COULD DAMAGE THE DEVICE. The pin outs for this connector are detailed in the appendix. Most CMOS or TTL functions / equipment can be adapted to make use of this connector.

9 Sync LED

This LED indicates the status of the fiber-optic link between the VIM-1808 and VIM-0808. It has three states; SOLID RED indicates there is no sync present; ALTERNATING RED & GREEN indicates the unit is searching for sync; SOLID GREEN indicates sync is present (optical link) and OFF indicates no power.

10 Power Connector / Fuse

The AC power connection to the VIM-1808 & VIM-0808 are made via the supplied IEC power cords. The internal power supply can accept 90-260V at either 50 or 60 Hz. The power fuse is a 5x20mm, 1A Slo-Blo. Only replace the fuse with an exact match. If after replacement the fuse blows again, contact Fiberplex for service.

11 Word Clock External Input

12 Clock Frequency Switch

chooses between analog line level and digital returns

13 Word Clock / Super Clock Output

Using the Light Viper VIM-1832

Standard Connection

Pass-thru Connection

Fiber Options

Tactical grade military fiber (TAC-4)

Used for live production applications (P/N TFC-0000-04). Weighing 8.4 lbs.(12.6kg) for(300)feet, this cable contains (4) fibers and therefore it is capable of carrying the signals of (2) systems on a single cable. The TAC-4 connectors are hermaphroditic and can be connected to one another. Multimode fiber can transport signals up to 2km (1.25 miles).



TAC-4

Neutrik OpticalCon® Fiber

This fiber cable contains (2) fibers and is also a tactical grade fiber (P/N TFC-0000-02OC).



Neutrik OpticalCon
Fiber Cable & Panel
Mount Connector

PVC fiber

PVC duplex fiber contains (2) fibers. Plenum rated fiber is also available. The installer can terminate the fiber themselves, or Fiberplex can supply it pre-terminated. This fiber is also available with a strain relief and "pulling eye" which reduces on site labor.



Plenum Install Fiber

LightViper VIM-1832 / 1032 Specifications

Specifications

<ul style="list-style-type: none"> • 8 x 8 fiber optic transport system • Cable runs over 1.25 miles with no loss • Rugged, lightweight fiber cable • 24 bit / 96kHz sampling (24/48k with ext. input) 	<ul style="list-style-type: none"> • Analog line level OR AES digital input • Simultaneous analog / AES3 digital outputs • Heavy gauge steel construction • Extended range and flexibility means limitless routing options
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General Specifications

Total Harmonic Distortion + Noise*1	Less than 0.01%	1 KHz @ +4 dBu
Frequency Response	± 0.5 dB	20-20kHz @ +16 dBu
Dynamic Range	102 dB	
Crosstalk	5 dB above noise floor	
Sampling Rate	24 bit / 96kHz or 24 bit / 48 kHz	
Latency	630 µs one way, analog input to digital output, 20µs one way, digital input to digital output.	
Operating Temp	0 to +50°C ambient temperature.	
Sync LED	LED (green) indicates optical link OK, LED (red) indicates problem with optical link, LED (off) indicates no power.	
AC Power	Universal 90-250 VAC, 50/60 Hz, IEC connector with fuse	
Max Current Rating	VIM-1808 / VIM-0808	0.473 mA @ 90V
On / Off Control Date + MIDI	RJ-45 connector for logic level control, CMOS or TTL at 2 MHz max per channel.	
Dimensions	VIM-1808 / VIM-0808	1 Rack Unit X 6.5" Deep
Weight	VIM-1808 / VIM-0808 300 ft Fiber Cable (tactical)	6.5 lbs 6 lbs

*1-Hum & Noise are measured with an AES17 compliant filter at 20 kHz. Temperature condition @+10 - +25° C.

Input Characteristics

Connection	Gain Setting	Voltage Gain*2	Sensitivity*3	S/N ref +0dBu	Overload	Clipping	Input Impedance	
Analog Sends 1-8*4	0	0(0 dB)	1.65 Vrms	-83 dBu	+16 dBu	+19 dBu	XLR	1.8 kΩ 10 kΩ
Analog Returns 1-8	n/a	0(0 dB)	1.65 mVrms	-83 dBu	+16 dBu	+19 dBu	TRS	2 kΩ
Digital sends & Returns 1-8 (Mixer End)	AES3 Digital							

*1-Hum & Noise are measured with an AES17 compliant filter at 20 kHz. Temperature condition @+10 - +25° C. *2-0dBu is referenced to 0.775Vrms. *3-Sensitivity is the lowest level that will produce an output of +4dBu (1.23V).

Output Characteristics

Connection	Actual Source Impedance	For Use With Nominal	Output Level*2		Max	Connector*1	
Analog Returns 1-8 (Stage Box)*1	150 Ω□	600 Ω Lines	+4 dBu (1.23 V)		+19 dBu (7 V)	DB-25, Tascam™ DA-88 pinout, 8	
Analog Sends 1-8 (Mixer End)	150 Ω□	600 Ω Lines	+4 dBu (1.23 V)		+19 dBu (7 V)	DB-25, Tascam™ DA-88 pinout, 8 channels per connector	
Digital Sends & Returns 1-8	AES3 Digital						

*1-All XLR connectors are balanced. *2-0 dBu is referenced to 0.775 Vrms.

Optical Characteristics

Connector*1	Installation Tension	Operating Tension	Min Bend Radius	Crush Resistance	Weight
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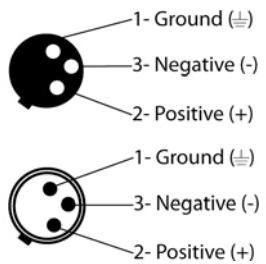
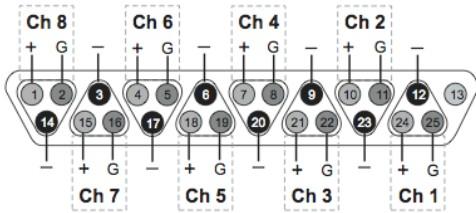
Fiber-Optic Cable*2	400 lbs	130 lbs	3.7"	228 lb/in ²	19 lbs / 1000'
Optical Fiber*3	Attenuation	Bandwidth	Numerical Aperture	System Optical Data Rate	System Operating Distance
	1 dB/Km @1300 nm	500 MHz/Km @ 1300 nm	0.275	122 Mbs	2 Km (1.25 mi)

*1-TAC-4 4 channel SMPTE compliant, *2-Four Channel Tactical Break Out Cable, 0.30"(7.5mm) Outer Diameter, Kevlar™ Strength Member *3-Graded Index, Multimode, Dual Window (850/1300nm)

Appendix

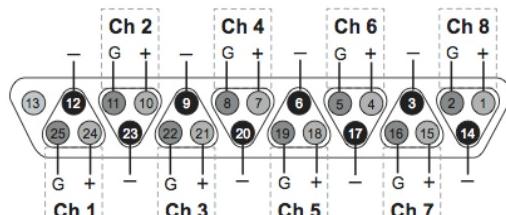
ANALOG – DB25 Cable Pin Outs

1. Ch. 8 +	14. Ch. 8 -
2. Ch. 8 G	15. Ch. 7 +
3. Ch. 7 -	16. Ch. 7 G
4. Ch. 6 +	17. Ch. 6 -
5. Ch. 6 G	18. Ch. 5 +
6. Ch. 5 -	19. Ch. 5 G
7. Ch. 4 +	20. Ch. 4 -
8. Ch. 4 G	21. Ch. 3 +
9. Ch. 3 -	22. Ch. 3 G
10. Ch. 2 +	23. Ch. 2 -
11. Ch. 2 G	24. Ch. 1 +
12. Ch. 1 -	25. Ch. 1 G
13. Unused	



ANALOG Connector Pin Outs

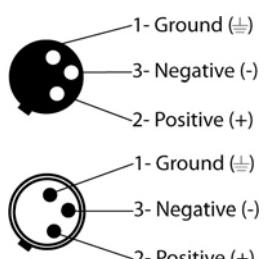
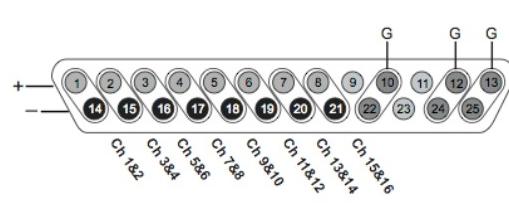
1. Ch. 8 +	14. Ch. 8 -
2. Ch. 8 G	15. Ch. 7 +
3. Ch. 7 -	16. Ch. 7 G
4. Ch. 6 +	17. Ch. 6 -
5. Ch. 6 G	18. Ch. 5 +
6. Ch. 5 -	19. Ch. 5 G
7. Ch. 4 +	20. Ch. 4 -
8. Ch. 4 G	21. Ch. 3 +
9. Ch. 3 -	22. Ch. 3 G
10. Ch. 2 +	23. Ch. 2 -
11. Ch. 2 G	24. Ch. 1 +
12. Ch. 1 -	25. Ch. 1 G
13. Unused	



Analog Audio Connector Pin Out

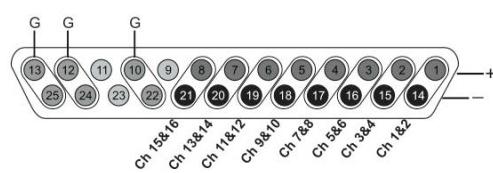
Digital Connector Pin Outs

1. Ch 1&2 +	14. Ch 1&2 -
2. Ch. 3&4 +	15. Ch. 3&4 -
3. Ch 5&6 +	16. Ch. 5&6 -
4. Ch. 7&8 +	17. Ch. 7&8 -
5. Ch. 9&10 +	18. Ch. 9&10 -
6. Ch. 11&12 +	19. Ch. 11&12 -
7. Ch. 13&14 +	20. Ch. 13&14 -
8. Ch 15 & 16 +	21. Ch. 15&16 -
9. Unused	22. Gnd.
10. Gnd.	23. Unused
11. Unused	24. Gnd.
12. Gnd.	25. Gnd.
13. Gnd.	



Digital Connector Pin Outs

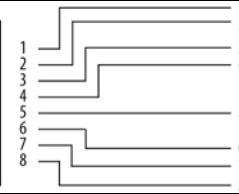
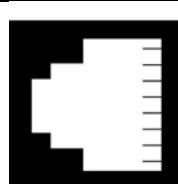
1. Ch 1&2 +	14. Ch 1&2 -
2. Ch. 3&4 +	15. Ch. 3&4 -
3. Ch 5&6 +	16. Ch. 5&6 -
4. Ch. 7&8 +	17. Ch. 7&8 -
5. Ch. 9&10 +	18. Ch. 9&10 -
6. Ch. 11&12 +	19. Ch. 11&12 -
7. Ch. 13&14 +	20. Ch. 13&14 -
8. Ch 15 & 16 +	21. Ch. 15&16 -
9. Unused	22. Gnd.
10. Gnd.	23. Unused
11. Unused	24. Gnd.
12. Gnd.	25. Gnd.
13. Gnd.	



Digital Audio Connector Pin Out

Control Circuits RJ-45 Pin Outs

1. GND
2. TX1
3. TX2
4. TX3
5. RX1
6. RX2
7. RX3
8. VCC +5VDC

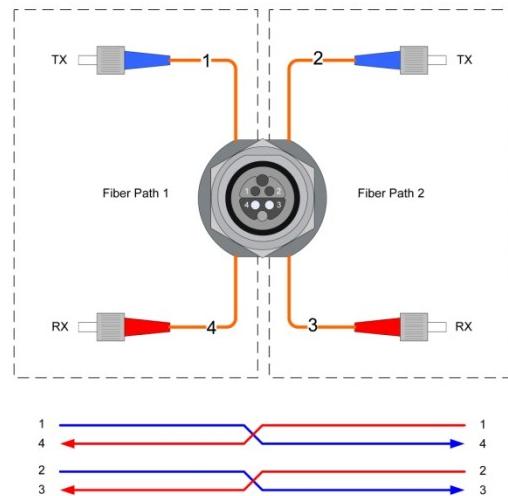


TAC-4 Installation Instructions

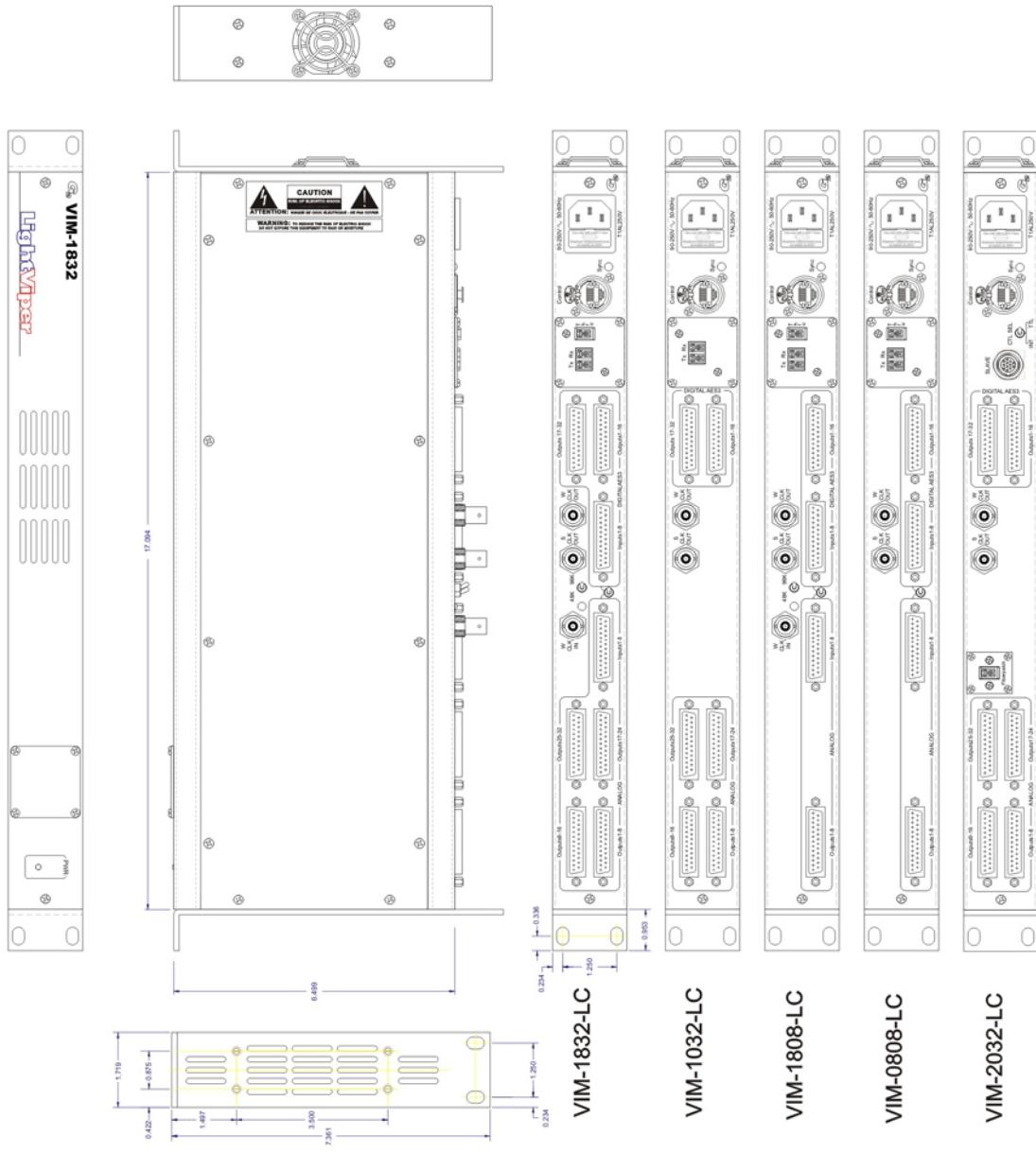
When using TAC-4 panel mount connectors:

Due to the hermaphroditic nature of the TAC-4 connector, channels 1 & 4 and 2 & 3 are crossed by necessity. Therefore, pins 1 & 2 should always be connected to connectors marked TX and pins 3 & 4 should always be connected to pins marked RX. Pins 1 & 4 are always paired together and pins 2 & 3 will always be paired together.

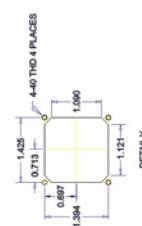
Important Note: A single TAC-4 connector and cable contains (4) fibers and can transport both pairs of fiber inputs/outputs of the EF-2 on a single connector / cable. If using Neutrik OpticalCon, two cables / connectors are required, one for each pair, as the OpticalCon cable and connectors contain (2) fibers. When using LC or ST fiber connectors on the chassis of the EF-2, the connectors are mounted on the rear of the unit. Alternatively these fiber connectors can be mounted on the front panel of the unit.



Final Assembly Drawing



UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES: FRACTION 4/164 X.OX 4/10 Y.OY 1/100 ANGLES		ENGL	HSD III	DATE:
		DRAWN	HSD III	5/17/2009
		REVIEW		
		CHECKED		
MATERIAL	#16 (0.069) CRS	FROM:	E	117126
FINISH:		REV:	B	
		SHEET:	1	OF 1



0504-042 Grafton Rd.
Annapolis Junction MD 20703
503-604-2000
fiberprix.com • light-prix.com

fiberplex
LightViper

VIM-1832/1032/1808/0808/2032 Final

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